

What is claimed is:

1. A method of fabricating a substrate with color filter, comprising the steps of:

(a) providing a substrate;

5 (b) forming a color filter above the substrate, wherein the color filter comprises opening portions;

(c) filling the opening portions in the color filter; and

(d) planarizing the color filter.

2. The method as claimed in claim 1, wherein the step of
10 forming the color filter comprises the step of forming color portions adjacent to the opening portions, wherein the planarizing step comprises planarizing the colored portions with respect to the filled opening portions.

3. The method as claimed in claim 2, wherein the color
15 filter substrate is of the transflective type, and wherein the colored portions and the opening portions correspond to transmissive areas and reflective areas of the color filter substrate respectively.

4. The method as claimed in claim 2, wherein the step of
20 forming the color portions comprises the steps of spin-coating color photoresists and applying lithographic process to define the color portions.

5. The method as claimed in claim 2, wherein the filling step comprises the step of forming a layer of transparent

material over the colored portions and filling the opening portions, and wherein the planarizing step comprises planarizing the colored portions with respect to the opening portions.

6. The method as claimed in claim 5, wherein the step of
5 forming the layer comprises the step of spin-coating.

7. The method as claimed in claim 5, wherein the layer comprises one of a transparent resist material, a transparent light-sensitive material and a heat sensitive material.

8. The method as claimed in claim 1, further comprising
10 the step of forming an electrode layer overlying above the color filter.

9. The method as claimed in claim 8, wherein the electrode layer is a transparent conductive film.

10. The method as claimed in claim 9, further comprising
15 the step of forming a plurality of spacers on the electrode layer.

11. The method as claimed in claim 10, wherein the spacers are formed, comprising the steps of spin-coating photoresist and applying photolithographic process to define the spacers.

20 12. The method as claimed in claim 1, wherein the planarizing step comprises the step of polishing.

13. The method as claimed in claim 12, wherein the polishing step comprises the step(s) of performing a chemical mechanical polishing (CMP).

14. The method as claimed in claim 1, wherein the color
5 filter forming step forms a color filter that comprises color portions that are uneven, and the planarizing step comprises planarizing the color portions to obtain an even surface.

15. The method as claimed in claim 14, wherein the colored
10 portions extend over underlying structures on the substrate, thereby causing unevenness in the colored portions.

16. The method as claimed in claim 15, further comprising
the step of forming light blocking portions adjacent to colored
portions on the substrate, wherein the underlying structures
comprise the light blocking portions, and wherein the colored
15 portions extends over the light blocking portions.

17. The method as claimed in claim 16, wherein the light
blocking portions is formed prior to forming the adjacent
colored portions.

18. The method as claimed in claim 16, wherein the
20 planarizing step does not expose the underlying light blocking
portions.

19. A color filter fabricated in accordance with the
method of claim 1.

20. A method of fabricating a liquid crystal display panel, comprising the steps of:

forming a color filter substrate using the method of claim

1;

5 providing a liquid crystal display element;

providing an array substrate; and

assembling the color filter substrate and the array substrate with liquid crystal layer therebetween.

21. A liquid crystal display panel fabricated in
10 accordance with the method of claim 20.

22. A liquid crystal display device, comprising:

a liquid crystal display panel of claim 21; and

a controller coupled to the liquid crystal display panel to control the liquid crystal display panel to render an

15 image in accordance with an input.

23. An electronic device, comprising:

a liquid crystal display device of claim 22; and

input device coupled to the controller of the liquid crystal display to render an image.